Backup Software Strategy

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CSS/TOC

Current Strategy

- Everyone to their own devices (within reason)
  - Legacy, familiarity, cost, features, Software/hardware restrictions
- Backup Exec
- TIBS
- Legato
- AMANDA
- Oracle database
- Others – FMB, BRU, tar……

Backup Exec System

- ~50 Windows servers backed up by TOC, located WH7W
  - ~13,660,000 files, ~1.6 TBytes
- Daily incrementals, Full on weekends
  - Fulls start Friday evening & end Sunday morning
- 6 weeks of fulls, 3 weeks of daily incrementals, a snapshot of a monthly full is kept for 1 year.
- 3 Windows-based systems each with a single DLT tape robot
  - 2 drives each (DLT7000 & SuperDLT)
  - Cost: 50 slot/2 drive Super DLT robot $13,500, 120 tapes $110 each Backup Exec Server software $1,200 (covers one tape drive), client $140 each Windows system, PC $3,500
    - ~$35K per backup server

TIBs Backup system

- 40 servers backup by CSI, including AFS, Email gateways
  - 760GB nightly of 1.4TB of data???
- Daily incrementals, with software created fulls.
- Effectively there are 1 years worth of backups for AFS areas.
- 1 server - Sun E250 with an AIT-3 tape library
  - 4 drives - 125 slots
  - Cost: $48,000 for robot (includes tapes), $10,600 system, TIBs software $45,000 (no limit on clients/OS type), AIT-3 tape $58
    - $103,600 per system

Legato

- 2 systems backing up ~ 16 servers at D0
- 1- Sun, 1- SGI each with one Exabyte 200 robot
  - These systems are not dedicated but multifunctional.
- A snapshot monthly kept for one year. Weekly fulls and daily incrementals kept for ~ 6 weeks.
- Their UNIX systems were already in use but ~ cost of $10K each, the Exabyte 200 robot ~$40K using 8mm Mammoth-2 tapes ~$75 each, the software cost was ~$8K but limited to 10 clients of one flavor. Additional charges for drives and flavors of backup client.
  - ~ $60K per system.

FMB – Fermi Modular Backup

- Fermi designed and supported software.
  - Scripts written around the dump and cpio UNIX backup utilities. Can backup local and remote drives.
- Used on many systems/clusters at Fermi
  - MISCOMP, cdusv2, FASIC, CADWHS, Beams Mechanical ……
- Supports UNIX systems and most drives and robots.
- Cost - software no upfront cost, but equipment (system/robots/drives/tapes) would be similar to other systems depending on type.
- CSS trying to phase-out support to the open source software -Amanda.

AMANDA software

- Open source, proposed successor to FMB - Support and enhancements responsibility delegated onto the larger AMANDA user community.

- Can be run as a dedicated server, but existing installs have been on local systems. B0dau35, Build cluster, Beams …

- Supports UNIX backups, can backup Windows mounted shares using Samba.

- Modules to support most tape drives and robots.

- Cost - software no upfront cost, but equipment (system/robots/drives/tapes) would be similar to other systems depending on type.

Oracle Systems

- 12 DB servers (Unix and Windows) use RMAN (Oracle backup package) to backup to local disks. Dzero, CDF, MISCOMP, ODSOEM(W2K). Local disk backup to tape archive based on Sysadmin preference!
    - Fcdfora1 – tar with a 14 day rotation with a monthly saved for a year.
    - B0dau35/36 – Amanda to 15-DLT stacker 4 week tape rotation
    - D0ora1 – Legato software to Exabyte 200 tape
    - D0o1b/c – bru software to DLT stacker 4 month rotation
    - MISCOMP – FMB software to 7-DLT stacker 4- week rotation; Monthly – 1 year
    - Odsoem (W2K) – Backup Exec software - with TOC rotation
        - https://misdev1.fnal.gov:443/supportdb/projects/backup_recovery_briefing_Mar19.html

Advantages to a centralized strategy?

- Cost efficiencies in a coordinated significant *long-term* software purchase?
- Cost efficiencies in large/multiple robot purchases?
- Cost efficiencies in using excess capacity in existing robots?
- Cost efficiencies in bulk media purchases?
- Cost efficiencies of an identified and centralized workforce with established thorough knowledge/experience with a backup package(s) and a hardware technology?
- Cost efficiencies in a single maintenance contracts for like hardware and software.
- Advantages to smaller groups that might not be able to afford a more robust feature rich backup software package.
  - GUI interface, search utility, scheduling, faster backup ….

If you build it …..

…will they come?

Can one package do it all??

- They say it is possible.
  - Tolis Group – bru, Teradactyl –TiBS, Legato – Networker, Veritas - NetBackup
    - Client support; Windows, UNIX, LINUX
    - Tape drive support; DLT, SDLT, Exabyte, AIT-3, LTO
    - Tape library support;
    - Advanced features
    - Cost money!!
  - FMB, AMANDA, & Veritas – Backup Exec,
    - limitations

Can one hardware model do it all?

- Powerful system with excellent I/O capabilities and large amount of disk.
  - More than one?
- The offline storage robot - One model fits all?
  - Same manufacturer?
  - Same drives and number of drives?
  - Same tapes type, same make?
  - Same number of slots?
- Do we want to lock into one technology/vendor?
- What are the requirements to be considered?
- Does Fermi have existing equipment that meets the need?

Issues

- Switching cost
  - Current investment in other hardware/software
  - Security (access across the net)
  - De-installing existing software and reinstalling new standard client?
  - Training
  - Meeting a diverse customer base particular/individual needs
  - How will restores be done and within what timeframe?
  - Centralized service - how to distribute cost
  - Standards of performance (Will systems have to meet certain performance and/or importance criteria?)

Worth an Investigation? Yes

- Software has improved and time is right

- Once established/published a phased-in approach would allow for orderly transition of customer data.

- Phase-in approach allows for fine tune operational issues that might develop.

- With a central package the Computing Division can more easily identify costs involved with backups.

- Users can choose an alternative method, but they have to support.